

The opinion in support of the decision being entered today is *not* binding
precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRAD GEVING, KRIS ALAN SCHMIDT,
and KENNETH J. NEWELL

Appeal 2006-2380
Application 10/791,079
Technology Center 1700

Decided: July 31, 2007

Before BRADLEY R. GARRIS, JEFFREY T. SMITH and
CATHERINE Q. TIMM, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal the final rejection of claims 1-7, 9-15, 32, and 34-51 under 35 U.S.C. § 134. We have jurisdiction over the appeal pursuant to 35 U.S.C. § 6(b).

We AFFIRM.

INTRODUCTION

Appellants claim a powder blend composition for use in a solid free form fabrication process, such as a laser sintering process (Specification 1; claim 1). The powder blend is composed of metal powder blended with or coated with a polymeric binder system and also includes a high melting temperature fine particulate metallic, intermetallic, or ceramic (Specification 12).

Claim 1 is illustrative:

1. A powder blend for use in a laser sintering process comprising:

a steel alloy of about 88.75 to about 92.75 percent by weight selected from the group consisting of a mild steel alloy, a carbon steel and a stainless steel;

a polymeric binder from about 1.25 to about 2.25 percent by weight; and

a high melting temperature fine metallic, intermetallic, or ceramic particulate of greater than about 5 percent and less than about 15 percent by weight.

The Examiner relies on the following prior art references as evidence of unpatentability:

Gardner	US 4,554,218	Nov. 19, 1985
Luk	US 5,782,954	Jul. 21, 1998
Bray	US 6,048,379	Apr. 11, 2000

The rejections as presented by the Examiner are as follows:

1. Claims 1-7, 9-11, 34-44, 50, and 51 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner.¹

¹ Claim 44 was inadvertently omitted from the statements of the rejections. However, the record is clear that claim 44 should be rejected under § 103(a)

2. Claims 12, 13, 32, 45, 46, and 49 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner in view of Bray.
3. Claims 14, 15, 47, and 48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner in view of Luk.

Appellants separately argue independent claims 1 and 36. Therefore, in accordance with their ultimate dependencies, claims 2-7, 9-15, 32, 34, 35, and 37-51 stand or fall with these independent claims.

OPINION

35 U.S.C. § 103(a) GARDNER

Appellants argue that the Examiner's application of Gardner's disclosure at column 8, lines 62-68, which is directed to a thermoplastic-thermoset binder combination, to calculate the amount of binder in Gardner's Example 2 is based on hindsight because Example 2 is limited to using thermoplastic binder (Br. 9-10). Appellants further argue that, even if Gardner's column 8 disclosure is applicable to Example 2, the amount of binder in the thermoplastic-thermoset binder of column 8 includes both the thermoplastic portion and thermoset portion of the binder, which calculates to a binder percentage outside the claimed range (i.e., 3.5% by weight) (Br. 10-11).

over Gardner. Appellants understand that claim 44 is rejected over the art of record by their statement that "these claims (1-7, 9-15, 32 and 34-51) are finally rejected" (Br. 2).

We have considered all of Appellants' arguments and find them unpersuasive for the reasons below.

The issues presented by this appeal are as follows: (1) whether the claim phrase "a polymeric binder" may properly be construed to include Gardner's mixture of thermoplastic-thermoset binders, and, if so, (2) whether the claimed weight percent of the polymeric binder (i.e., "about 1.25 to about 2.25 percent by weight") would have been obvious from Gardner's disclosure.

Generally, during examination, the claims must be interpreted as broadly as their terms reasonably allow. *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1369, 70 USPQ2d 1827, 1834 (Fed. Cir. 2004). Additionally, it would have been obvious for an artisan with ordinary skill to develop workable or even optimum ranges for such art-recognized, result-effective parameters. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-1937 (Fed. Cir. 1990); *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

In the present case, the Examiner construes the claim phrase, "a polymeric binder" as inclusive of a mixture of binders wherein the weight percent of any one binder in the mixture may be used to satisfy the claimed polymeric binder range (Answer 6). The Examiner's claim construction is supported by Appellants' disclosure in their Specification that the polymeric binder may be "thermoplastics, thermosets, or a combination thereof" (Specification 12: 29-30). Accordingly, we find the Examiner's claim construction of the phrase "a polymeric binder" to be reasonable. *American Academy of Science Tech Center*, 367 F.3d at 1369, 70 USPQ2d at 1834.

Therefore, the claim phrase “a polymeric binder” includes a mixture of polymeric binders.

Since the Examiner’s construction of “a polymeric binder” is reasonable, we address whether the weight percent of the polymeric binder claimed (i.e., “about 1.25 to about 2.25% by weight”) is rendered obvious by Gardner’s disclosure.

Gardner discloses that a particularly useful thermoplastic-thermoset binder has, in relevant part, 29.6 parts “Epon” 825 bis-phenol-A epoxy resin (i.e., the thermoset portion of the thermoplastic-thermoset binder) (Gardner, col. 8, ll. 63-64). The Examiner applies this disclosure to Gardner’s Example 2, which indicates that the binder amount used is 57 grams (i.e., 5.4 wt% of the total blend disclosed in Example 2) and calculates that the weight percent of thermosetting polymeric binder in the mixture is 1.5 wt% (i.e., $5.4\% \times .296$). The Examiner’s calculation with respect to Example 2 has not been challenged by Appellants.

Gardner further discloses that the amounts of the thermoplastic-thermoset binder may have to be empirically adjusted to optimize production of a part (Gardner, col. 9, ll. 1-3). Accordingly, Gardner recognizes that the amount of thermoset and thermoplastic binder in the mixture are result-effective variables such that it would have been obvious for an artisan with ordinary skill to develop workable or even optimum ranges for such art-recognized, result-effective parameters. *Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936-37; *Boesch*, 617 F.2d at 276, 205 USPQ at 219; *Aller*, 220 F.2d at 456, 105 USPQ at 235.

From the record before us, the amount of “a polymeric binder” in claim 1 has not been established to be anything other than an optimizable

range. No criticality (i.e., unexpected results) of the claimed polymeric binder range has been shown by Appellants. *Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936 (explaining that “applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range.”). Therefore, it would have been obvious to one of ordinary skill in the art to optimize the amount of polymeric binder (i.e., thermoplastic and thermoset) so as to optimize the production of an article (Gardner col. 9, ll. 1-3). *Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936-37; *Boesch*, 617 F.2d at 276, 205 USPQ at 219; *Aller*, 220 F.2d at 456, 105 USPQ at 235.

We add that it would have been obvious to combine the claimed weight percentage of “a polymeric binder” (i.e., “about 1.25 to about 2.25 percent by weight”) with Gardner’s powdered metal blend since such would be a predictable variation in that no criticality of the claimed range (e.g., unexpected results) has been shown. *KSR Int’l Inc. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). Stated differently, the combination of the claimed weight percentage of “a polymeric binder” (i.e., “about 1.25 to about 2.25 percent by weight”) with Gardner’s powdered metal blend is merely the predictable use of prior art elements (i.e., the amount of binder in the powder composition) according to their established functions (i.e., to prevent internal fractures in the green molded article (e.g., to enhance the “green” strength of the article) and to completely volatilize the binder after forming the article to improve the infiltration of the metal) (Gardner, col. 7, ll. 29-39, 60-68; col. 9, ll. 1-3). *Id.*

Regarding Appellants’ hindsight argument, Gardner discloses using thermoplastic binders and thermoplastic-thermoset binders (Gardner, col. 7,

ll. 40-42). Accordingly, applying Gardner's disclosure to use thermoplastic-thermoset binders to Example 2 at column 16, lines 49-60 is based on the explicit disclosures of Gardner not on hindsight. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998).

For the above reasons, we affirm the Examiner's § 103(a) rejection of argued claims 1 and 36 and non-argued claims 2-7, 9-11, 34, 35, 37-44, 50, and 51 over Gardner.

THE OTHER § 103(a) REJECTIONS

Appellants do not separately argue the following rejections: (1) dependent claims 12, 13, 32, 45, 46, and 49 under § 103(a) over Gardner in view of Bray, and (2) dependent claims 14, 15, 47, and 48 under § 103(a) over Gardner in view of Luk. Rather, Appellants base the viability of these rejections on the propriety of rejecting independent claims 1 and 36 under § 103(a) over Gardner. As we discussed above, we determine that the Examiner's rejection of claims 1-7, 9-11, 34-44, 50, and 51 under § 103(a) over Gardner is proper.

Accordingly, we affirm the Examiner's following rejections: (1) dependent claims 12, 13, 32, 45, 46, and 49 under § 103(a) over Gardner in view of Bray, and (2) dependent claims 14, 15, 47, and 48 under § 103(a) over Gardner in view of Luk.

DECISION

The Examiner's rejection of claims 1-7, 9-11, 34-44, 50, and 51 under 35 U.S.C. § 103(a) as being unpatentable over Gardner is **AFFIRMED**.

The Examiner's rejection of claims 12, 13, 32, 45, 46, and 49 under 35 U.S.C. § 103(a) as being unpatentable over Gardner in view of Bray is **AFFIRMED**.

Appeal 2006-2380
Application 10/791,079

The Examiner's rejection of claims 14, 15, 47, and 48 under 35 U.S.C. § 103(a) as being unpatentable over Gardner in view of Luk is AFFIRMED.

The Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

sld/ls/cam

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